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ABSTRACT

In this paper, an elementary school teacher describes her experiences with the Memory Stack--a HyperCard based tool that can accommodate a voice recording, a graphic image, and a written text on the same card--which she designed to help her second and third grade students integrate their oral language fluency into the process of learning how to write. Detailed descriptions are presented of three second grade students' experiences with the Memory Stack. All three children were experiencing extreme difficulty acquiring the technical and linguistic skills necessary to relate symbols to speech. Suggestions are provided for how this type of pedagogy can be developed further for use in diagnosis of language problems and in assessment of language development. Eight figures depict the students' projects. (Author/AEF)

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Paper (W2-202B)

The Memory Stack: New Technologies Harness Talking for Writing

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Abstract

An elementary school teacher describes her experiences with the Memory Stack. The Memory Stack is a *HyperCard* based tool which she designed to help her second and third grade Chapter 1 students integrate their oral language fluency into the process of learning to write.

Developing the Memory Stack

Most of my children are great storytellers. When they talk about their lives they are excited, animated, and sometimes sad, and they produce a lot of oral text. When they compose on paper, in a notebook, or even on the computer screen, those stories are often deadened; they lack the spunk and most of the substance of the oral work. Many of my children produce "bor-ring" texts —texts that seem to be labels for the ideas children have in mind, and for stories they want to tell.

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"On my birthday, I played and blowed out my candles. The End"

Before I developed the Memory Stack, I had continually sought ways to capture my children's fluency with oral language. I'd experimented with dictation and tape recorders, but found both lacking. In dictation, the listener writes. The composer simply gets to copy over the text, and never grapples with spelling, punctuation, and the other conventions unique to written language. Tape recorders work better, but young children get frustrated because they fumble around, shifting focus from operating the machine to transcribing on paper or computer screen.

My reading in the area of composition theory encouraged me in my belief that my children's oral fluency could be harnessed to help them become successful composers. Ann Haas Dyson calls oral language "the rooting system in learning to write" (Dyson, 1981). She says, "Talk is an integral part of beginning to write, providing both meaning, and for some children, the systematic means for getting that meaning on paper" (Dyson, 1981, p.783). Collette Diaute stresses the importance of talk to learning to write. She says:

> In brief, a major part of learning how to write is learning how to talk to one's self (Diaute, 1983, p.137)

James Britton, in speaking about the transition young children must make when learning to write says:

> ...the more the written forms resemble spoken forms at their command, the easier the transition is likely to be (Britton, 1982, p.125).

Soon after I received my two Macintosh LC computers in the spring of 1991, I discovered the wonderful potential of the microphone which comes with that machine and the audio palette available in *HyperCard* 2.0 or 2.1. (Palette is a apt name for the audio program available in *HyperCard*. It allows a child to play with sound, including the sound of her own voice as a creative medium.) I became so excited by these tools that I spent the major part of the next weekend designing the Memory Stack.

The Memory Stack is a simple *HyperCard* stack that can accommodate a voice recording, a graphic image, and a written text on the same card. When a child composes in the Memory Stack, she composes orally first, and relies on her oral language strengths to support her learning of written language. This stack is an ideal tool for capturing the lively talk-bites my kids produce each day, and bringing them into the realm of written language Together the children and I have developed a computer-age kind of "Talk-Write" program (Zoellner, 1983). The newer Macintosh technology makes this type of pedagogy a realistic option when teaching young children.

Other teachers and researchers are also experimenting with these capabilities. In her research Diaute has worked with teachers and third and fourth grade remedial students in a genre she calls "Multimedia Composing." Her work emphasizes children's strengths with "nontextual media" including the "living media of social interaction and talk" (1992, p.251).

In this paper I describe my experiences teaching and learning with the Memory Stack; I detail how the children and I use it in our daily work, and I suggest how this type of pedagogy can be developed further for use in diagnosis of language problems and in assessment of language development.

Using the Memory Stack

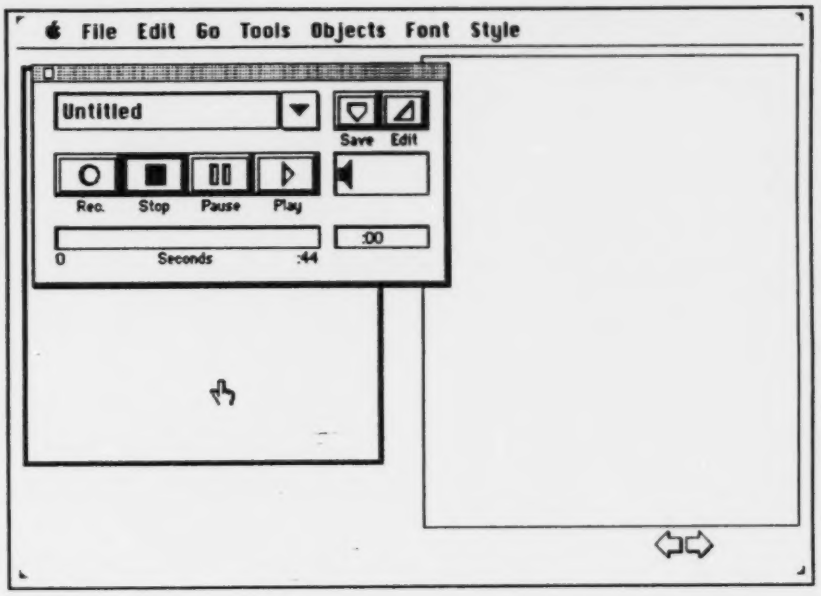

Figure 1. The Memory Stack Card

Using the Memory Stack is easy. Children tell their stories into the microphone, save them, and then play them back a few words at a time using the "Pause" button to navigate through the oral language. Then they move the mouse to the text field side of the card, click on it, and transcribe their texts. They returns to the audio palette, play a few words more, and go back to the text field to continue transcribing. Some children do all their work in one sitting. For others, it is easier to work on their transcriptions a little at a time. It doesn't matter how a child chooses to work because the children's oral language is always there to support them whenever they return to work on their cards. (One of my second graders explained the name of the Memory Stack to a classmate in this way; "It's called that because it remembers your words for you.") When the transcription is complete, we print out the cards and place them on construction paper backings for display. Often kids want to make five or six copies for parents, aunts, teachers, friends, etc.

We actually began referring to this stack as the Memory Stack because the first project we did with it was a simple multimedia project on memories. I asked my children to bring in photos that made them remember events, people, places or things that were special to them. Using HyperScan, a simple program that comes with the Apple Scanner, I scanned the photos and pasted them on to cards in the stack so that each child had an individual card. Then, using the audio palette, the children taped their memories. If the picture was a photo of the author, I saved the sound with a button which looks like a comic strip bubble. I placed the bubble on the mouth of the speaker. When the button was "clicked on" by the mouse, the picture of the speaker seemed to tell the story.

Finally, the author transcribed the oral text into a text field which was placed next to the photo on her card. This is the memory card which Paula, then a third grader, made in the Spring of 1991.

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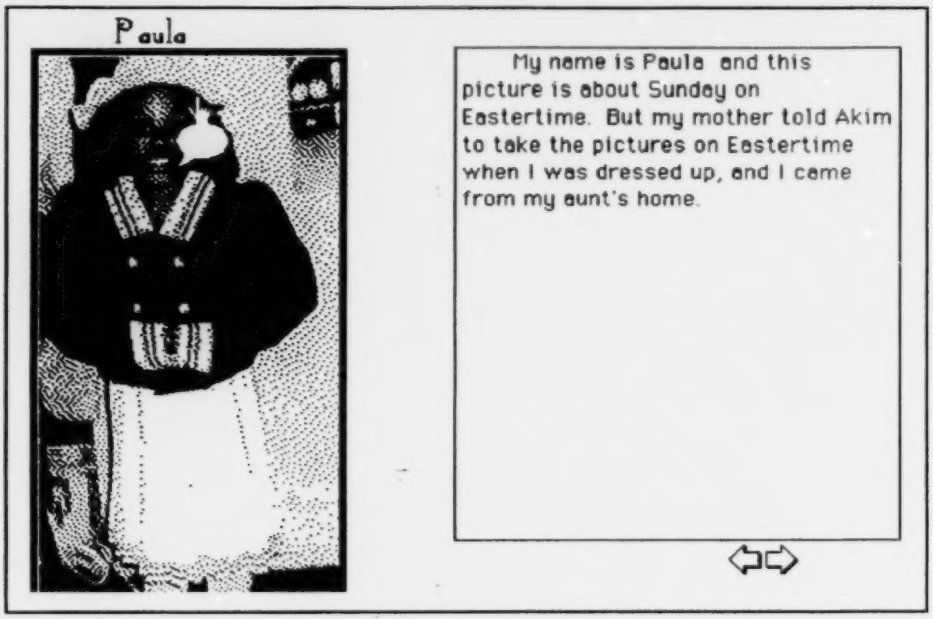
Paula
My name is Paula and this picture is about Sunday on Eastertime. But my mother told Akim to take the pictures on Eastertime when I was dressed up, and I came from my aunt's home.

Figure 2. Paula's Memory

Just before Christmas 1991, I decided to use the Memory Stack for what I called our "Gifts of the Magi!" project. This was related to our school's Spanish as a Second Language Program's study of the cultural significance of the Three Kings. The children in this program make presentations and bring gifts on January 6th to all the classrooms in our school, so "Three Kings Day" has become a school-wide winter celebration.

We talked a great deal about gift-giving, and especially about gifts that can't be bought—like the long journey that each king made to see the infant. We talked about a gift as a means for one person to honor another. I asked my third graders to think of people who were special to them; people whom she would like to honor with a gift of her writing. I took a Polaroid snapshot of each child, scanned it with HyperScan, and pasted the photo onto a card in the Memory Stack. The children recorded messages to their special person, and transcribed them. Since these were to be final published products, I had an editing conference with each child to "clean-up" the transcriptions. Children, who wished to do so, added Chanukah and Christmas clip-art to their cards. Two of the children taped their messages in two languages, one child in Spanish and English, and another in Chinese and English. Unfortunately, neither child felt confident enough to try to write in her native tongue, so we only have the oral versions in the first languages. We printed three copies of each one and mounted them on red, green, or blue paper. One was sent as a gift, one became part of our "Gifts of the Magi" display, and one was for the author.

Tim, whose older brother is in the Navy and was unable to be home for Christmas, created the card below. He felt his brother's absence deeply, and creating his card helped to deal with those feelings. He was very proud of this card. I'm sure his brother was honored!

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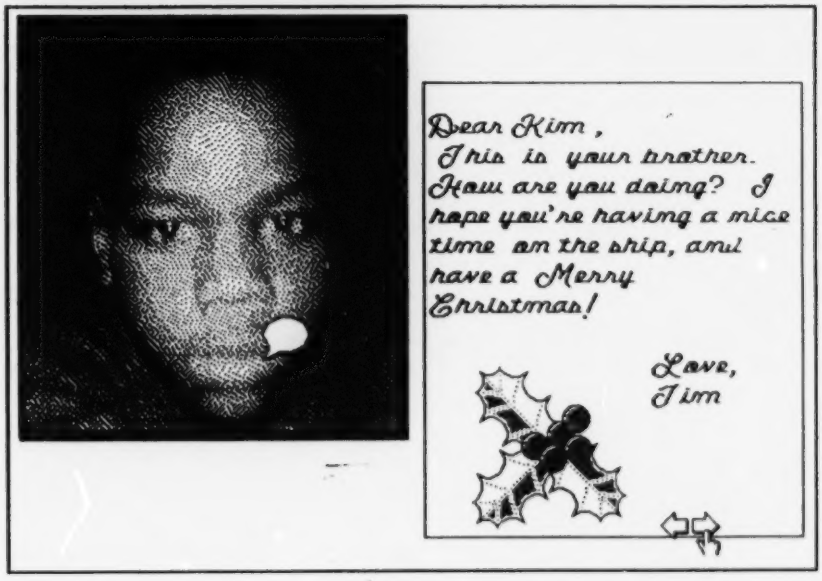

Figure 3. Terry's Gift

Teaching with the Memory Stack

When we fist created the Memory Stack, I thought of it as a tool to be used with children like Paula and Tim, children who already had reasonable facility with invented spelling. Barry Kroll speaks of three phases of the writing process which were useful to me when I was thinking about what I wanted to accomplish with the Memory Stack. He speaks of the "preparation phase," the phase in which children are still acquiring the "technical skills necessary to create symbols for speech," the consolidation phase in which children can relate speaking and writing so that writing skills "become progressively strengthened by drawing on the generally more mature language resources" and the "differentiation phase" when children understand that writing and speaking differ in style and function (Kroll, 1981, p.39).

Initially, I saw the Memory Stack as a tool to move children from the consolidation phase toward the differentiation phase. One of my teaching goals in designing the stack was to create a medium in which children could accomplish written language tasks independently, relying only on their own oral language for support. When Paula transcribed her Easter piece, and Tim his Magi piece, they worked independently , drawing on their "more mature (oral)language resources."

My work with a special group of three second graders during the 1992-1993 school year taught me that the Memory Stack could be used with children who are in what Kroll calls the "preparation phase"—with terrific results. Dion, Pat ,and Laura were all experiencing extreme difficulty acquiring the technical and linguistic skills necessary to relate symbols to speech All three of them had such great gaps in their knowledge of sound/letter correspondence that they found invented spelling frustrating. In September, two of these children were lacking a significant number of reading readiness skills. The third was struggling with one syllable sight words. For them, "creating symbols for speech" was frustrating and arduous work.

In February, I decided to use the Memory Stack with this group of three children for three reasons. (a) I wanted to see how well they could adapt to this kind of technology based instruction; to see if the computer motivated any of them. (They loved games and skills software that functioned like games.) (b) Because they were already in the middle of grade 2 and experiencing such great difficulty, I wanted to give each of them a chance to be successful with language: an opportunity to write a whole text with minimal frustration and tangible rewards. (c) I also wanted to get some insight into how these children conceived of narrative; I wanted to see how each of them structured the telling of a personal tale.

Using the Memory Stack with these children was rewarding and revealing. Each time I sat with a child at the computer, I learned something about each child as a composer, and as a reader and writer of text. Along the way, I discovered that the Memory Stack is a wonderful tool both for teaching phonics out of whole language and for assessing the linguistic strengths of beginning readers and writers.

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Dion

Dion is a bright-eyed extremely affectionate seven-year -old second grader. His academic difficulties are compounded by emotional difficulties. One morning as I was greeting the children as they entered the building, Dion grabbed my hand and proceeded to tell me all about finding a dog which his grandma said he could keep. He was very excited and the language rolled off his tongue in a cohesive story which I could follow. Dion had never written a story like that. He would become so frustrated after writing the first line or two of a piece that he would cry, and the story wouldn't get done.

Later on that day, he came to my Chapter 1 class in the Mac lab. I asked, "Dion, Could you write about your new dog. "

He wrote:" I hav a new dog."

I said, "Dion, I want the story you told me this morning about the dog chasing your bike."

He said, "I can't write all that!"

I asked "But can you tell the story to the computer just like you told me."

He said, "Sure, I can do that."

We sat down together at the LC. I found a "clip-art" dog file, and we copied the dog he chose from that selection. I opened the Memory Stack, pasted in the picture of the dog, and Dion recorded his story. Then we sat down together to transcribe. I showed him how to use the play and pause buttons on the audio palette, and he went to work. We worked together on sounding-out the words and he hit the keys on the keyboard—oral, visual,and tactile— all the modalities, all at once; working holistically from a complete text. This interaction naturally combined so much of what makes for a rich learning experience.

We continued to slowly grapple with his language, and he became more excited as he made his speech become text. Dion loved to form the "ou" sound with his mouth, and reveled in that sound as he typed the letters "o" and "u." He had no difficulty with long vowel sounds. He knew where he wanted to put in periods.

Dion is fairly logical in his organization of narrative. He began his taping with his title "My Dog." Then he proceeded to tell his tale chronologically. He finds a logical ending for his narrative by simply putting his dog in the house. Dion also has a sense that written language has to be proper. He taped that he "brung" his dog into the house, but when he was transcribing, he said, "Brung ain't right." I said that the proper word was "brought," and so he wrote "brot."

We spent some part of two more periods on his text, and when he finished, he was extremely proud of himself, requesting copies for his teacher, his grandma, and his cousins. This is his finished product.

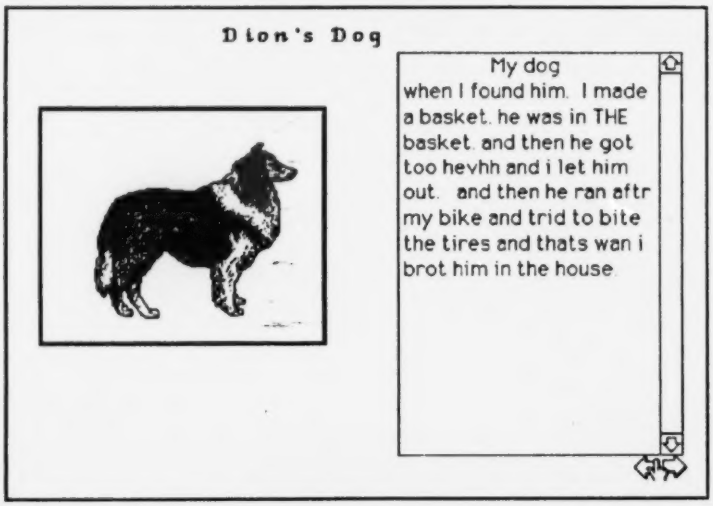
Dion's Dog
My dog
when I found him. I made
a basket. he was in THE
basket. and then he got
too hevhh and i let him
out. and then he ran aftr
my bike and trid to bite
the tires and thats wan i
brot him in the house

Figure 4. Dion's Dog

Later on this past spring, I offered children opportunities to publish bound books in multiple copies for the Young Authors program. I told them they could use a journal entry, a story they had already written, a book they made earlier, a Memory Stack entry, or they could write a new story. I really did not expect Dion to want to participate, but he surprised me. He asked if he could make a book from his "dog story."

We opened the Memory Stack and copied the text into a word processor. I told Dion that he would need to edit his story so that spelling and punctuation would be correct, to make it easier for a reader to follow his words. He read it to me, I asked some questions, and Dion edited his story. We divided it into pages and printed it out so that Dion could draw his illustrations. Dion's Dog was a "picture book" selection on our Young Author's list.

This method is a terrific way to compose personal experience stories, because the sequential framework that such stories take make them easy to tell. But my experiences with Dion taught me that this method is also useful for more transactional kinds of narratives.

Dion's class did a great deal of hands-on science. On one particular day when I went to pick him up, his teacher said, "We're keeping a science journal on our experiments. Today we worked on bulbs and batteries, and I can't get Dion to write one sentence in his journal."

I took Dion back to the lab, and we sat down at the keyboard. He was dejected and disappointed in himself because he knew that his teacher was a bit irritated with him. I went into a clip-art file and found a drawing of a light bulb to motivate him; to show him that he could have the best journal page in his class if he produced it on the computer. We copied the light bulb into our Mac scrapbook and opened up the Memories stack, and pasted it in on a new card. I opened the audio palette and handed Dion the microphone. I said, "Tell the computer what you did today with bulbs and batteries." He happily recorded his journal entry. He knew exactly what he had done with bulbs and batteries. He transcribed his whole entry in one sitting—remaining with me into his lunch period to do it. We printed it out, and he came back after lunch to pick up three copies. I had to stop him from running to his classroom with his work. That was a real triumph for him, for me, and for this method of composing.

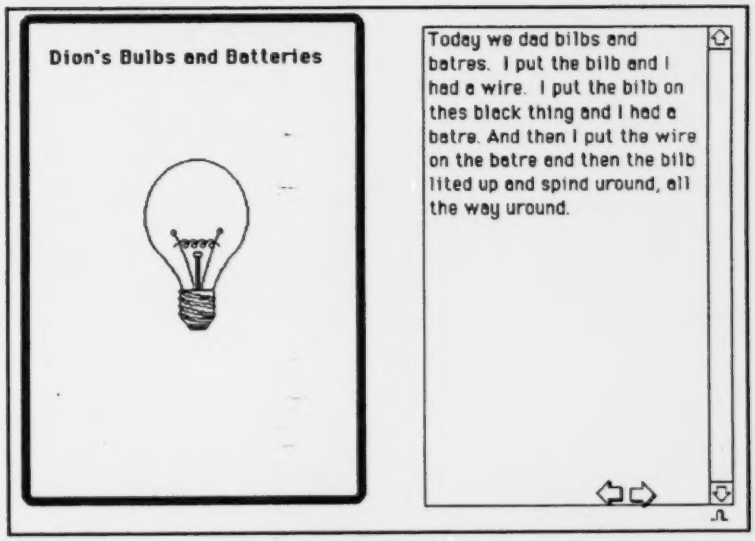
Dion's Bulbs and Batteries
Today we dad bilbs and batres. I put the bilb and I had a wire. I put the bilb on thes black thing and I had a batre. And then I put the wire on the batre and then the bilb lited up and spind uround, all the way uround.

Figure 5. Dion's Bulbs and Batteries

Pat

Pat came back to second grade in the fall with very few reading skills. He was not sure of many of the initial consonant sounds, and he certainly could not work with vowels. Pat is an extremely impulsive seven-year-old. He'll jump up and run across the lab if he hears an appealing beep. He doesn't realize he's doing it, so it is very hard for him to control himself. Pat is very sensitive, and becomes extremely hurt if an adult attempts to point out his behaviors to him. In short, he is a difficult child to teach.

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Not wishing to be outdone by Dion, Pat wanted to tell me about his dog. He didn't have a picture of his dog so he too chose a clip-art dog which he said looked like his dog. We pasted it on a card in the Memory Stack, and Pat taped his tale. He produced so much language that we needed to make two buttons on his card to save it all, stopping in the middle. We played back the first half, and then he continued composing the rest. Pat had never before composed more than one sentence on paper or on the screen. He easily became extremely frustrated and alienated from the experience of writing. But, it turns out, he had a lot he wanted to say. This is Pat's story.

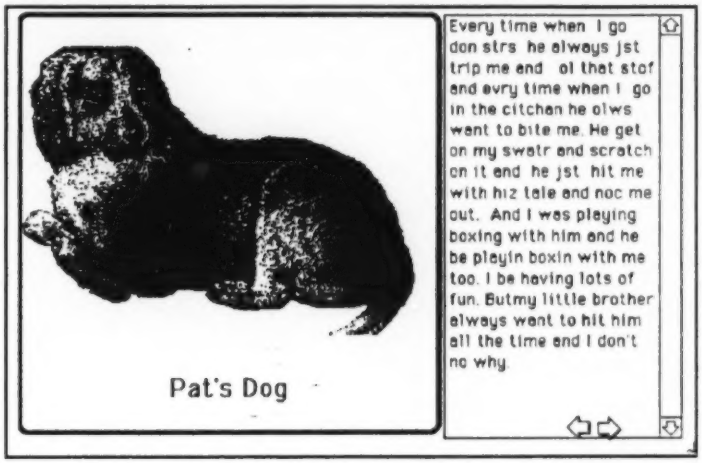
Every time when I go don strs he always jst trip me and ol that stof and evry time when I go in the citchen he alws want to bite me. He get on my swatr and scratch on it and he jst hit me with hiz tale and noc me out. And I was playing boxing with him and he be playin boxin with me too. I be having lots of fun. Butmy little brother always want to hit him all the time and I don't no why.
Pat's Dog

Figure 6. Pat's Dog

Pat was daunted at the thought that he might have to write all those words. I explained that he could do a little at a time until he finished. And he did. I sat with Pat a good deal of the time and took notes while we worked. I was learning so much about him! I found out which sounds he needed help with before he could attempt an invented spelling. I began to understand how much he depended upon sight vocabulary. As we slowly sounded words out together, he typed the letter he thought went with the sounds we were making. I learned that Pat could remember something he had been taught at one point and forget it on the next line as with the "ing" ending in the word "boxing." I found that he knew a rule he had been taught. He said, "time puts an 'e' if the 'i' sounds like that;" I also found out that he could not apply the same rule to a words he could not spell by sight. I reminded him of the rule so that he would discover that he could spell "bite" correctly.

I learned that Pat organized his thoughts for this piece by excitement level, moving from "tripping" to "biting" to fighting in the kitchen to playing "boxing." He ends his piece in a rather poetic way, moving from his relationship with the dog which he understands to his confusion about why his brother always wants to hit the dog.

The most important thing I learned was that Pat could produce a good deal of text even though he has severe language problems. The most important thing Pat learned was that he could write his own story! This method was extremely liberating for him and for me.

Laura

Laura is a bouncy seven-year-old. In fact, she has very little attention span, even when it comes to computer games. She spends barely two minutes on one, and she asks to move to another. She cannot focus long enough to become involved in an activity so that it becomes interesting. She was a non-reader in September.

Laura wanted to tell the computer about her birthday, and she too created a prodigious amount of text for a seven year old with language problems. As Laura worked on her transcription, I learned that Laura was missing basic short vowel knowledge, and also had difficulty with "r -controlled" vowels. She could not hear the sound of "o" in mother or the sound of "a" in father, but she knew the "ou" sound and could spell "outside." She was able to deal quite well with long vowels.

Like Pat, she was very excited when she taped her piece, and that excitement is clear in the tone of her voice. She said that her birthday was in three weeks, probably because she "couldn't wait." But when it came time to transcribe her piece, she changed weeks to months. Like Dion, she seemed to have a certain respect for the truth of the written word, and she was

a bit awed by her own story as it became print— a "real writer's experience." "I can't write weeks; that's not right; it's months." And so she wrote "months." Janet Emig refers to this phenomenon as the "aura" around the written word which she contrasts to the "mundane" nature of talk.(Emig, 1981,.p.87)

Laura organized her piece sequentially, as she remembered the sequence of events that made up past birthdays. The excitement in her oral voice, comes through well in the written voice. The reader is pulled along with her from one activity to the next until we all collapse in front of the TV at her grandmother's house to play Genesis.

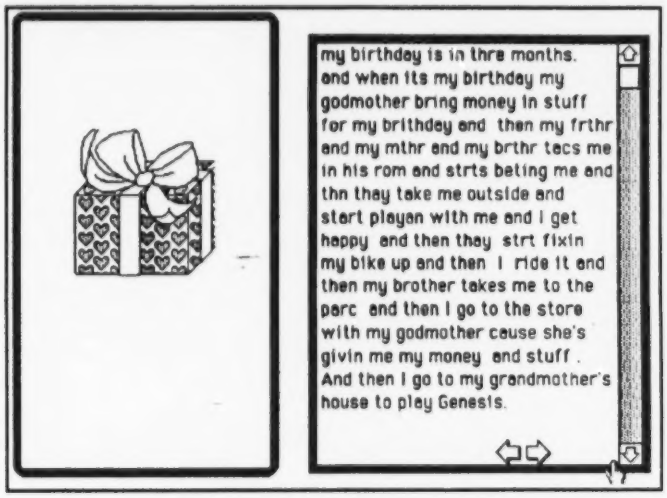
my birthday is in thre months.
and when its my birthday my
godmother bring money in stuff
for my brithday and then my frthr
and my mthr and my brthr tecs me
in his rom and strts beting me and
thn they take me outside and
start playan with me and I get
happy and then they strt fixin
my bike up and then I ride it and
then my brother takes me to the
parc and then I go to the store
with my godmother cause she's
givin me my money and stuff .
And then I go to my grandmother's
house to play Genesis.

Figure 7. Laura's Birthday

Children Define a Memory Stack Project

Word of the "talking computer" spread through the second grade, and two boys in Pat's class, Sam and Andrew, asked me if they could use the computer to tape their rap. I said, "OK, but you have to type the rap after you tape it and make a picture to go with it. Both boys thought that was a pretty good idea. Sam did the drawing, and Andrew taped the rap. They even put in sound effects, made by mouth that they couldn't transcribe, although Andrew tried. Not being a Rap aficionado, I don't know if their rap was original, but that didn't matter to me. What mattered was that two little boys, completely on their own, worked together to create a whole piece of publishable work. They demanded that I check the spelling and "fix it up." They wanted it to be right, and they wanted many copies to distribute. This is the final product, "D. Swift's Rap."

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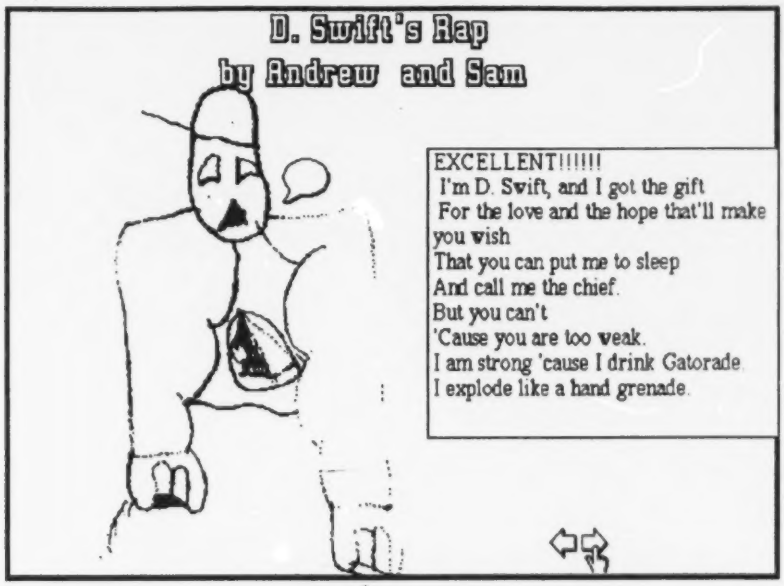
D. Swift's Rap
by Andrew and Sam
EXCELLENT!!!!!!
I'm D. Swift, and I got the gift
For the love and the hope that'll make you wish
That you can put me to sleep
And call me the chief.
But you can't
'Cause you are too weak.
I am strong 'cause I drink Gatorade
I explode like a hand grenade.

Figure 8. D Swift's Rap

Dyson writes that we can begin to help children learn grow as writers by recognizing "the tools of early writing: the pencil...and the voice" (Dyson, 1981, p.784). When a child uses the Memory Stack as her composing tool, she uses a keyboard rather than a pencil, and integrates not only the voice, but the tone and narrative structure of her oral language into the writing process in a new kind of composing activity made possible by new technology.

Note: For a more complete description of the functioning of *HyperCard* 2.0, the Audio Palette and the Memory Stack, see Gannon, M. (1992). "Talking texts: The new Macintosh computer and the reading/writing classroom."

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